

# GENEALOGY DATABASE ENTRY

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Harkins, William Draper

1873 - 1951

DEGREE: PhD

DATE: 1907

PLACE: Stanford

TEACHER/RESEARCH ADVISOR: Swain

investigated surface chemistry, nuclear and atomic structure, and isotope separations; pioneer in nuclear fusion reactions and identified such processes as the source of stellar energy; discovered the existence of nuclear excited states and the nuclear "packing effect"; independently (with Hardy and Langmuir) suggested the theory of orientation of organic molecules in contact with water; investigated emulsion polymerization, soap micelles, and matters related to the formation of colloids; predicted the existence of the neutron and of heavy hydrogen; first to separate isotopes - using the diffusion of HCl through clay pipe stems to obtain  $^{35}\text{Cl}$ ,  $^{37}\text{Cl}$ , and  $^{39}\text{Cl}$ ; suggested in 1915 that hydrogen could be transformed to helium and thus liberate energy; showed that the stability and abundance of the elements in stars could be predicted from the relative loss of mass in the fusion reactions of atom-building; recognized that even-numbered elements are more stable.

1. Advisor confirmed by comparing thesis title and published papers.
2. *Dictionary of Scientific Biography*; Charles Scribner's Sons: 1970-1990; vol. 6, p. 117-119.
3. Asimov, I. *Asimov's Biographical Encyclopedia of Science and Technology (2nd Ed.)*; Doubleday: 1982; p649.
4. *Dictionary of American Biography*; Malone, D., Ed.; Charles Scribner's Sons: 1936; vol. 5 (Suppl.), p273-274.
5. *Biog. Mem. Nat. Acad. Sci.* **1975**, 47, 49-81.
6. *National Cyclopaedia of American Biography*; James T. White & Co.: 1921-1984; vol. 42, p312-313.
7. *Dictionary of Scientific Biography*; Charles Scribner's Sons: 1970-1990; vol. 6, p117-120.
8. *American Chemists and Chemical Engineers*; Miles, W. D., Ed.; American Chemical Society: 1976; p196-198.